Reviewer replies

Thank you to the author for responding to the comments in the review. I apologise that the original comments were somewhat too brief and wish they had been more constructive. Some of the lack of clarity is due to the novel nature of the method. Here I will try to address the specific points in the author's response:

1. The case study in section 3 shows the method in practice and presents the category distribution for ice edge displacement distances for the model simulation and ice chart data under two different formulations. This section contains a lot of quantitative information, and it may be helpful to know how the end-user might translate the information, for example the distribution in table 2. The rank histogram in figure 5 and lines 200 to 205 give a more direct description of the range in the ability of the model has reproduced the position of max ice edge displacement. It would also be interesting to see if the ranks achieved by the model have a temporal or spatial pattern.

2. The inclusion of the additional sentences is a good idea. It will clarify that while pre-existing methods provide summary statistics for the quality of model results, this method specifically targets ice edge displacements from an expanding ice cover. Alongside this method will be of a higher value (than summary statistics) for site specific activities as mentioned by the author.

3. One additional comment: In line 203, it states that "For a random distribution of 235 integer numbers in the range 0 –9 the 0.005th and 0.995th percentiles are 4.015 and 4.985, respectively." It seems to imply that a random distribution of 235 integers between 0 and 9 will have 4.015 and 4.985 as the 0.005th and 0.995th percentiles respectively. I tried to reproduce this with various integer distributions with mean at 4.5 and cut-off at 0 and 9, but was not able to do so. Is the distribution mentioned in the statement restricted to certain condition that I misunderstood?

I want to reiterate that this is a very interesting new method for measuring ice edge displacement and will potentially find good use in the community. I hope the comments provided will help the final paper be more accessible and clearer for all readers. Thank you.